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REMARKS

The Office action has been carefully considered. The Office action rejected claims 1-37 and 40-55 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,738,971 to Chandrasekaran et al. ("Chandrasekaran"). Further, the Office action rejected claims 38 and 39 under 35 U.S.C. § 103(a) as being unpatentable over Chandrasekaran in view of U.S. Patent Publication No. 2003/0200467 to Choy et al. ("Choy"). Applicants respectfully disagree.

By present amendment, claim 30 was canceled to correct a numbering error; there were two instances of claim 30 filed; these instances correspond to new claims 56 and 57, respectively. No fee is believed to be due, as the Patent Office previously and correctly charged for 56 claims. Further, claim 45 has been amended to correct a typographical error. Applicants submit that the claims as filed were patentable over the prior art of record, and that the arguments herein are for purposes of clarifying the claims and/or for expediting allowance of the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Applicants thank the Examiner for the interview held (by telephone) on June 1, 2006. During the interview, the Examiner and applicants' attorney discussed the claims with respect to the prior art. The essence of applicants' position is incorporated in the remarks below.

Prior to discussing reasons why applicants believe that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

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The present invention is directed to a system and method in which multiple independent transactional resource managers are supported on a single logical volume, such that each resource manager becomes (in part) a unit of storage management. Instead of having one resource manager per logical file system volume, the single volume may be broken up into smaller parts with respect to transactional services.

In this regard, each resource manager independently maintains a set of transactional metadata associated with the resources (e.g., a collection of files) that are contained within its scope. For example, transactional metadata used to guarantee transactional consistency such as a log file, along with files used in a transaction, may comprise the set of resources within the scope of control of a resource manager. The resource manager thus corresponds to the collection of files for which it is responsible. Any scheme may be used to define the collection. A simple scheme is one where files are associated with the resource manager by having a common ancestor in a directory hierarchy. In this implementation, the resource manager can be thought of as corresponding to the sub-tree rooted at the ancestor, since the files in that sub-tree are managed by the resource manager.

A general architecture is provided that, for example, allows databases or other entities to be integrated with a transactional file system volume via the resource managers. For example, each database may include a table having a column containing references (e.g., in the form of UNC names) to files in the file system volume that are associated with a resource manager. Because multiple transactional resource managers are possible on a single volume, each database

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may have its own associated files, which may be separately collected on a logical

part of the volume that is independently associated with a transactional resource

manager. Further, because the independent resource managers are separate

units of management, operations to a database such as recovery do not affect the

operations of other databases or other volume users.

Note that the above description is for example and informational purposes

only, and should not be used to interpret the claims, which are discussed below.

§102 Rejections

Turning to the claims, independent claim 1 generally recites a system

comprising a logical volume of a file system, and a plurality of resource managers

maintained on the file system volume, each resource manager independent from

one another and having associated transactional metadata and a collection of

associated files.

The Office action rejected claim 1 as being anticipated by Chandrasekaran.

More specifically, the Office action contends that Chandrasekaran teaches a logical

volume of a file system. Column 2, lines 1-5 of Chandrasekaran is referenced.

Further, the Office action contends that Chandrasekaran teaches a plurality of

resource managers maintained on the file system volume. Column 1, lines 19-35

of Chandrasekaran is referenced. Finally, the Office action contends that

Chandrasekaran teaches each resource manager independent from one another

and having associated transactional metadata and a collection of associated files.

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Column 1, lines 25-35 and column 4, lines 50-62 of Chandrasekaran are

referenced. Applicants respectfully disagree.

Chandrasekaran is directed, generally, to a method and apparatus for using

a resource manager per node in a distributed environment to coordinate the

committing of files changes in a distributed transaction for the purposes of

redundant data storage. Chandrasekaran is thus an example of prior art that

utilizes a file system resource manager per respective file system, on a one-for-one

basis. Chandrasekaran is silent with respect to the concept of a volume or any

other area of storage, classification or logical demarcation within a file system. The

only disclosure from this reference regards the consistent referral in the figures and

specification to "database system" x04 and x06, wherein each of these entities

utilizes a dedicated resource manager, but only one per node.

The Office action argues that these database systems read on a volume.

However, even if so, the argument fails at this point, as no single "volume" in and of

itself discloses or even suggests "a plurality of resource managers maintained on

the file system volume" as recited in claim 1. In Chandrasekaran, each database

system corresponds to a single resource management system (Chandrasekaran,

col. 6, lines 23-24). Applicants submit that this prior art reference simply does not

teach anything about the manner in which a specific volume may be arranged with

resource managers in a distributed transaction system.

Furthermore, the term "transactional metadata" or anything even suggesting

such as concept also does not appear anywhere in the cited and applied prior art.

Transactional metadata, as used in the claims and consistent with the specification

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of the present invention, refers to metadata representing a collection of files and/or

a log file that may be used to guarantee transactional consistency in a transaction

within the scope of control of a resource manager. To the extent Chandrasekaran

may teach a log file, such a log file is dedicated to a single resource manager per

node. The present invention includes a plurality of resource managers per volume,

each having dedicated transactional metadata for facilitating the handling of files.

The difference is significant, because the present invention allows a single

volume to be broken up into smaller parts with respect to transactions, which

provides numerous benefits set forth in the specification. In terms of claim 1, the

prior art of record simply does not teach a plurality of resource managers

maintained on the file system volume, each resource manager independent from

one another and having associated transactional metadata and a collection of

associated files. For at least these reasons, applicants submit that claim 1 is

allowable over the prior art of record.

Applicants respectfully submit that dependent claims 2-16, by similar

analysis, are allowable. Each of these claims depends either directly or indirectly

from claim 1 and consequently includes the recitations of independent claim 1. As

discussed above, Chandrasekaran fails to disclose the recitations of claim 1 and

therefore these claims are also allowable over the prior art of record. In addition to

the recitations of claim 1 noted above, each of these dependent claims includes

additional patentable elements.

For example, claim 3 recites wherein at least one resource manager

comprises transactional file system metadata that differ from transactional file

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system metadata of another resource manager. As discussed above,

Chandrasekaran is silent with respect to delineating differences in logical memory

by volume. Thus, this reference simply teaches a conventional arrangement of one

resource manager per volume, and excludes any possibility that two may exist, let

alone with different transactional file system metadata. For at least this additional

reason, applicants submit that claim 3 is allowable over the prior art of record.

As another example, claim 15 essentially recites that each resource

manager corresponds to a directory hierarchy, and that the collection of associated

files comprises files logically under that directory hierarchy. Again,

Chandrasekaran is silent with respect to delineating differences in logical memory

by volume. Thus, with respect to a resource manager, this reference simply uses a

conventional arrangement of one resource manager per entire volume, which

excludes any possibility that each resource manager may have its own directory

hierarchy. For at least this additional reason, applicants submit that claim 15 is

allowable over the prior art of record.

Turning to the next independent claim, claim 17 generally recites a method

comprising separating a volume into a plurality of resource managers, each

resource manager associated with transaction metadata, receiving a request to

open a file system object associated with a resource manager, creating a file

control block for the file system object, determining whether the file control block

references a resource manager control block, and if not, discovering a resource

manager control block corresponding to the file system object and associating the

file control block with the discovered resource manager control block.

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The Office action rejected claim 17 as being anticipated by Chandrasekaran. More specifically, the Office action contends that Chandrasekaran teaches separating a volume into a plurality of resource managers, each resource manager associated with transaction metadata. Column 1, lines 19-35 and column 3, lines 28-37 of Chandrasekaran are referenced. Further, the Office action contends that Chandrasekaran teaches receiving a request to open a file system object associated with a resource manager. Column 7, lines 19-29 of Chandrasekaran is referenced. Further yet, the Office action contends that Chandrasekaran teaches creating a file control block for the file system object, determining whether the file control block references a resource manager control block. Column 2, lines 6-9 and column 3, lines 23-26 of Chandrasekaran are referenced. Still further, the Office action contends that Chandrasekaran teaches if not, discovering a resource manager control block corresponding to the file system object and associating the file control block with the discovered resource manager control block. Column 3, lines 28-37 of Chandrasekaran is referenced. Applicants respectfully disagree.

As discussed above, Chandrasekaran is directed, generally, to a method and apparatus for using a single resource manager per node to coordinate the committing of a distributed transaction. This commit changes process deals with files being transacted across many database systems, and each of these entities is associated with a single, dedicated file system resource manager, on a one-for-one basis. Indeed, Chandrasekaran is silent with respect to the term "volume" or any other storage area, classification or logical demarcation of file systems. The Office

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action's argument cannot be reasonably supported, as Chandrasekaran fails to disclose anything like "separating a volume into a plurality of resource managers."

The difference is significant, because, for example, on the same volume, actions taken with respect to one resource manager and database or the like need not affect the actions of another resource manager / other database.

Furthermore, the term transactional metadata (or anything like it) does not appear anywhere in the cited and applied prior art. The present invention includes a plurality of resource managers per volume, each having "dedicated transactional metadata for facilitating the handling of files." In terms of claim 17, the prior art of record simply does not teach such a concept.

For at least these reasons, applicants submit that claim 1 is allowable over the prior art of record.

Applicants respectfully submit that dependent claims 18-27, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 17 and consequently includes the recitations of independent claim 17. As discussed above, Chandrasekaran fails to disclose the recitations of claim 17 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 17 noted above, each of these dependent claims includes additional patentable elements.

Turning to the next independent claim, claim 28 generally recites a system comprising means for separating a volume into a plurality of units of management, each unit of management associated with transaction metadata, and database means having data maintained in a table and data maintained in a first unit of

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management on the file system, the first unit of management having at least one

property that is different relative to a property on a second unit of management.

The Office action rejected claim 28 as being anticipated by Chandrasekaran

and cited similar sections of Chandrasekaran as were cited previously with respect

to the rejection of claims 1 and 17. Applicants respectfully disagree.

Claim 28 recites a means for separating a volume into a plurality of units of

management, each unit of management associated with transaction metadata.

This particular recitation essentially is similar to the recitations in claim 17

regarding a method for separating a volume into several resource managers. As

clearly shown above, Chandrasekaran is absolutely silent with respect to the

concept of separating a volume into a plurality of units of management, and while

Chandrasekaran may teach resource managers distributed one per node, there is

certainly no specific disclosure or suggestion in Chandrasekaran as to a plurality of

resource managers per volume, let alone how to do so, or why it might be desirable

to do so. For at least these reasons, applicants submit that claim 28 is allowable

over the prior art of record.

Applicants respectfully submit that dependent claims 29-33, by similar

analysis, are allowable. Each of these claims depends either directly or indirectly

from claim 28 and consequently includes the recitations of independent claim 28.

As discussed above, Chandrasekaran fails to disclose the recitations of claim 28

and therefore these claims are also allowable over the prior art of record. In

addition to the recitations of claim 28 noted above, each of these dependent claims

includes additional patentable elements.

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Turning to the remaining two independent claims, claim 34 generally recites a method comprising separating a file system volume into a plurality of parts, associating at least one of the parts with a first resource manager and at least one other of the parts with a second resource manager, and providing transactional services via each resource manager. Claim 45 generally recites a method comprising separating a file system volume into a plurality of transactional resource managers that provide transactional services, and performing a function with respect to a selected resource manager, the resource managers being independent of one another such that the function is performed independently of any other resource manager.

The Office action rejected claims 34 and 45 as being anticipated by Chandrasekaran and cited similar sections of Chandrasekaran as were cited previously with respect to the rejection of claims 1 and 17. Applicants respectfully disagree.

Each of these claims recites similar language with respect to providing distinct resource managers for a single volume. As clearly shown above, Chandrasekaran is absolutely silent with respect to such a concept. For at least these reasons, applicants submit that claims 34 and 45 are allowable over the prior art of record.

Applicants respectfully submit that dependent claims 35-37, 40-44 and claims 46-55 are allowable, as each of these claims depends either directly or indirectly from claim 34 or 45, and consequently includes their respective limitations.

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§103 Rejections

The Office action rejected claims 39-39 as being unpatentable over
Chandrasekaran in view of Choy. Without detailing the specifics of these
rejections, applicants respectfully disagree.

To establish *prima facie* obviousness of a claimed invention, all of the claim
recitations must be taught or suggested by the prior art; (*In re Royka*, 490 F.2d
981, 180 USPQ 580 (CCPA 1974)), and "all words in a claim must be considered in
judging the patentability of that claim against the prior art;" (*In re Wilson*, 424 F.2d
1382, 1385, 165 USPQ 494, 496 (CCPA 1970)). Further, if prior art, in any
material respect teaches away from the claimed invention, the art cannot be used
to support an obviousness rejection. *In re Geisler*, 116 F.3d 1465, 1471, 43
USPQ2d 1362, 1366 (Fed Cir. 1997). Moreover, if a modification would render a
reference unsatisfactory for its intended purpose, the suggested modification /
combination is impermissible. See MPEP § 2143.01

Applicants submit that the Office action has failed to establish a *prima facie*
case for obviousness. Claims 38 and 39 each depend, respectively, from an
independent claim addressed previously, namely claim 34. Therefore, these
dependent claims, by similar analysis to their respective independent claim
discussed above, are allowable. As discussed above, Chandrasekaran's teachings
are considerably deficient with respect to disclosing or suggesting the limitations of
claim 34. Choy does not cure these major deficiencies, and thus Chandrasekaran
and Choy, whether considered individually or in any permissible combination with

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each other or any other prior art of record, fail to teach or even suggest the

recitations of these dependent claims or their respective independent claim.

Therefore these claims are also allowable over the prior art of record. In addition to

the recitations of claim 34 noted above, each of these dependent claims includes

additional patentable elements.

For at least these additional reasons, applicants submit that all the claims

are patentable over the prior art of record. Reconsideration and withdrawal of the

rejections in the Office action is respectfully requested and timely allowance of this
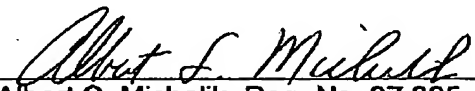
application is earnestly solicited.

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CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 1-55

are patentable over the prior art of record, and that the application is in good and

proper form for allowance. A favorable action on the part of the Examiner is

earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the

prosecution of the subject application, the Examiner is invited to call the

undersigned attorney at (425) 836-3030.

Respectfully submitted,

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Date: June 28, 2006   _____
                                   Albert S. Michalik

3740 amendment

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